(No Model.)

J. B. ALLFREE.

MILL FEEDING DEVICE.

No. 295,852. Patented Mar. 25, 1884.

Fig. 2.

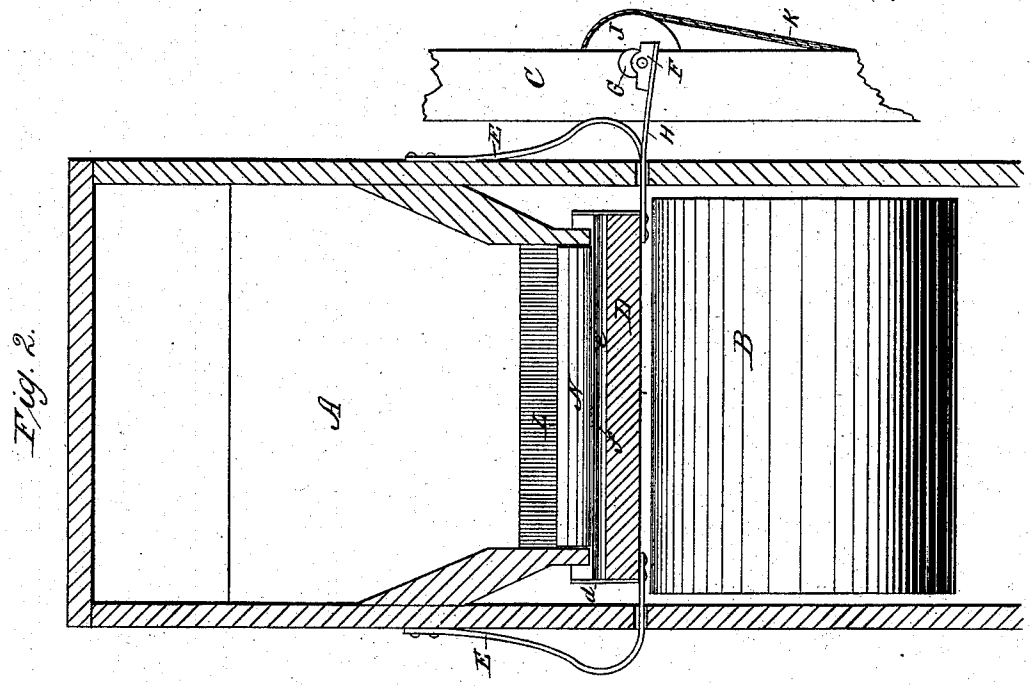
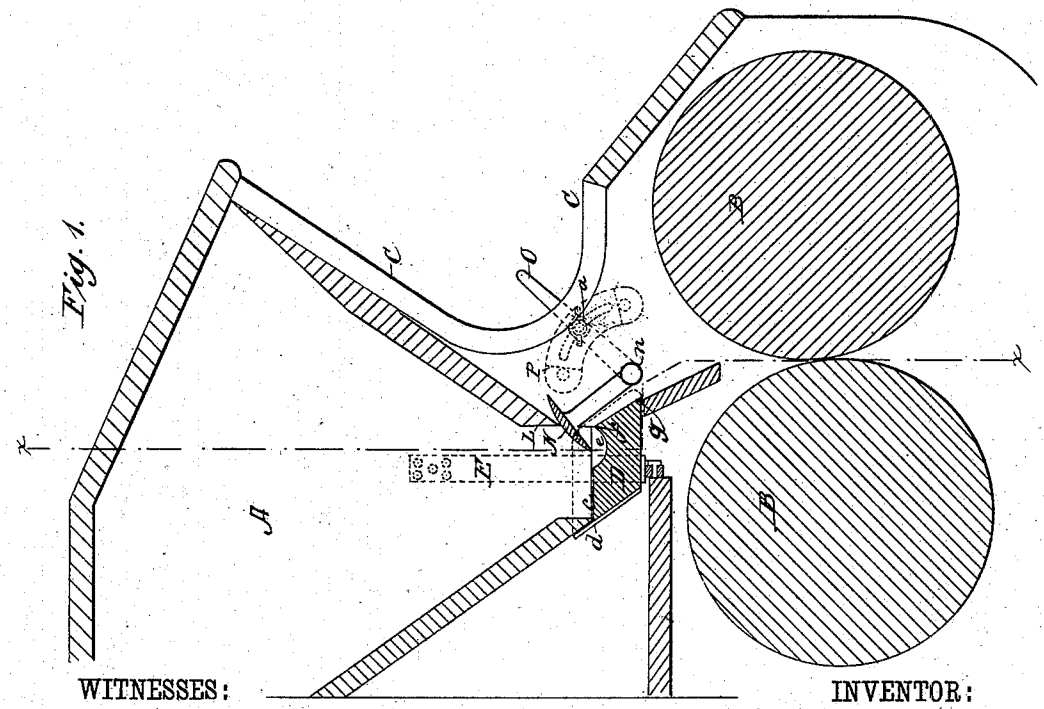


Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES B. ALLFREE, OF CUMBERLAND, MARYLAND.

MILL-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 295,852, dated March 25, 1884.

Application filed October 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. ALLFREE, a citizen of the United States, residing at Cumberland, in the county of Alleghany and State of Maryland, have invented a new and useful Improvement in Mill-Feeding Devices, of which the following is a specification.

My invention relates to that class of feeding devices used for feeding grain, middlings, &c., into mills for grinding, winnowing, &c., and it has for it object to spread the grain, &c., and deliver it into the mill in an even sheet the whole width of the delivery.

To this end my invention consists in a shoe having a trough therein hung to oscillate laterally to the path of the grain, the bottom of said trough being lower than its delivery-edge, and the shoe having a steep incline from said delivery-edge and a gate acting therewith, as hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of a portion of roller grinding-mill transverse to the rollers, showing my feeding device; and Fig. 2 is a vertical section of the same part in elevation longitudinal with the rollers.

I will describe my invention as applied to a roller-mill used for grinding wheat, middlings, tailings, &c., and shall speak of the material to be acted on as "grain."

A represents the hopper, by which the grain is received into the mill; B B, a pair of grinding-rollers, and C a portion of the frame.

D is a shoe hung at its ends by springs E, which are secured to the frame C.

H is a pitman connecting the shoe D with a crank, F, upon a shaft, G, journaled in the frame C, and provided with a pulley, J, which is revolved by a belt, K, from a counter-shaft in the lower part of the mill. The revolving of crank F communicates, through pitman H, a continuous reciprocating motion to the shoe D in the direction of its own length, but transversely to the line of travel of the grain in entering the mill. The shoe is provided with a ledge or guard, *d*, at its back and both ends, rising outside of the hopper a short distance to prevent the overflow of grain which may work under the edge of the hopper.

e is a trough, which is the main characteristic of my invention. This trough is located in the top of the floor of the shoe, along its delivery-edge *f*. The delivery extends, when open, from the lower edge, L, of the hopper to the edge *f* of the shoe. This delivery is closed to any degree desired by the miller by means of a gate, N, having trunnions *n*, journaled in the sides of the frame C, to oscillate by the action of an external arm, O, provided with a set-screw, *a*, engaging a fixed arc, P. The exterior form of the gate N is the arc of a cylinder having trunnions *n* as an axis to oscillate tangent to the edge L. The lower edge of the gate should stand nearly over the center of trough *e*, when at the height of the floor *c* of the shoe D. It may be set to entirely shut off the delivery of grain from the hopper into the mill by closing it down on the bottom of the trough. The action is as follows: The mill being in motion, grain entering the hopper falls upon the shoe, whose floor *c* slants gently toward the trough *e*, and by the shaking action of the crank F is worked into the trough until the trough is filled, when the grain spills over the edge *f* and glides down the face *f g*, which is steeper than the floor *c*, falling between the rollers B to be ground. The tendency of all streams is to run most freely midway. On that account it has been found very difficult to prevent the principal portion of the grain from being poured midway upon the rollers, thus utilizing only a portion of their length and wearing away that portion more rapidly than the rest. My invention wholly prevents this. Whether the hopper be full of grain continually or the supply be irregular, my trough *e* will be filled throughout its whole length by its lengthwise shake before it will deliver any grain, and whether it delivers a small or large quantity it will invariably deliver an even sheet over the edge *f* of the trough along its whole length. As an extreme case of test a small quantity of grain thrown in at one end of the hopper when trough *e* was barely full caused an equal quantity to be delivered over the whole length of edge *f*. This feeder has been tried with and will deliver with equal regularity and evenness, wheat, middlings, tailings, or returns.

A great advantage of my trough and gate is that while the delivery is almost shut off when the edge of the gate is at the level of the floor *c*, yet there is free space for lumps of grain,

dough-balls, &c., to pass beneath the gate through the trough. These dough-balls of middlings or tailings on passing over the edge *f* will be ground to pieces in rolling down the face *f g* which is being shaken, and will fall upon the rollers as though there had been no balls.

It is evident that wherever it is required to deliver grain or any comminuted substance in an even sheet—as for winnowing and such purposes—my trough and gate will work as well as in a roller flouring-mill.

What I claim, and wish to secure by Letters Patent, is—

1. The combination, with a hopper, open at its bottom and along one side thereof and a gate therefor, of a shoe having a trough in it, as and for the purpose specified, whereby a passage will be left beneath the gate through said trough when the gate is as low or lower than the delivery-edge of said trough, as described.

2. The combination, with a hopper and a gate, of an oscillatory shoe having a gently inclined floor, a trough along the lower edge of the incline, and a steeper incline descending from said lower edge, as described.

3. The combination, with a hopper having an opening at its bottom and a delivery along one edge thereof, of a shoe beneath said opening, having a trough whose bottom is lower than its delivery-edge, and means for shaking said shoe in a direction parallel with its delivery-edge, as shown and described.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

J. B. ALLFREE.

Witnesses:
CHAS. A. PETTIT,
SOLON C. KEMON.